Search for Weak and Long-Duration Gamma-Ray Bursts from Earth Occultation Background Model Residuals

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We report a search technique for Gamma-Ray Bursts too weak to trigger the on-board threshold. The technique is to search residuals from a physically based background model used for analysis of point sources by the Earth occultation method. Searching residuals (as opposed to raw data) minimizes false triggers from occultation edges and many other effects which lead to a rapid variation in the raw count rate. The background model is based on physical parameters, such as charged particle count rates and atmospheric secondaries. This allows fitting to long periods (e.g., several orbits), which in turn increases search effectiveness for bursts of longer duration. Initial results and expectations are presented.